

Fig. 1

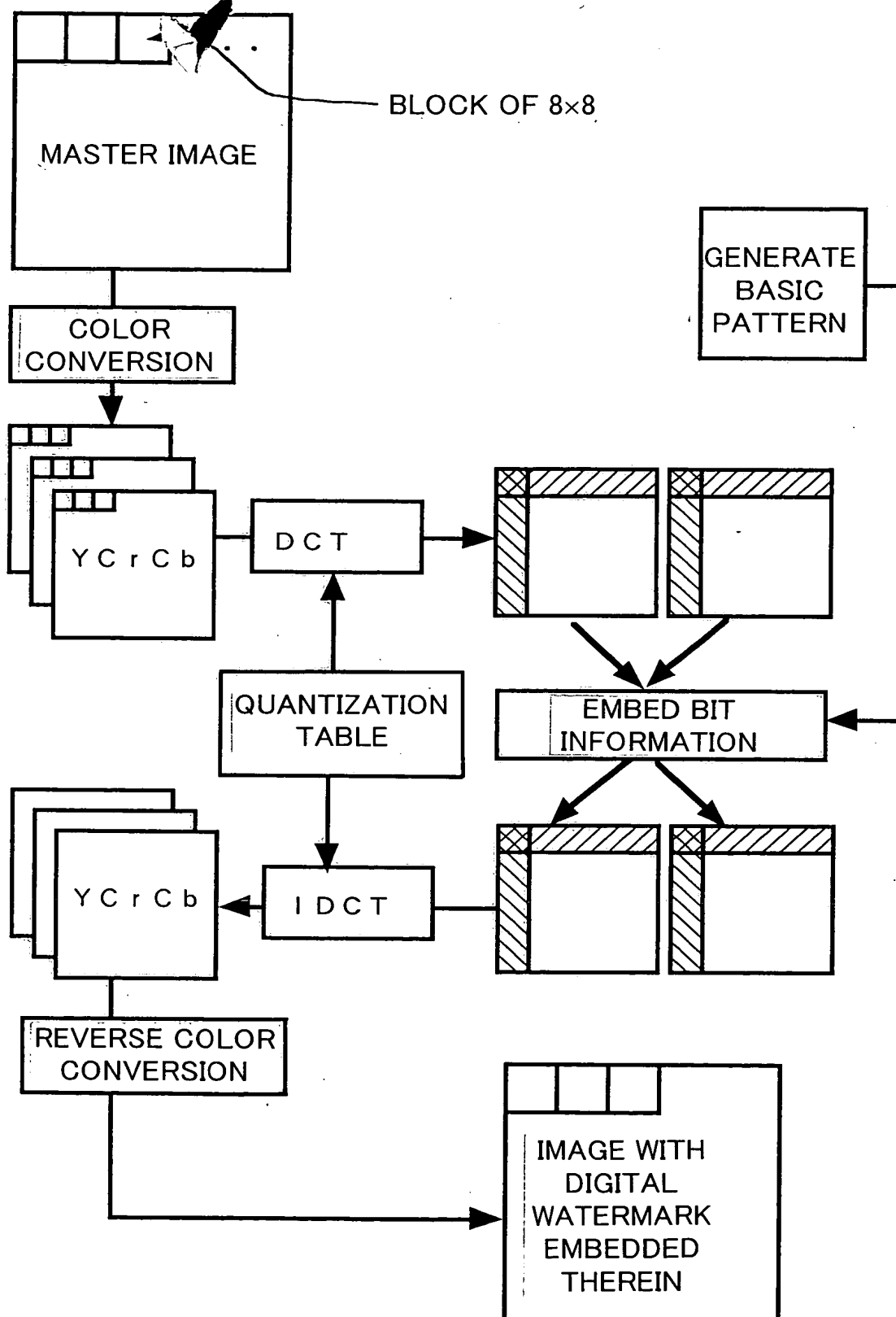


Fig.2

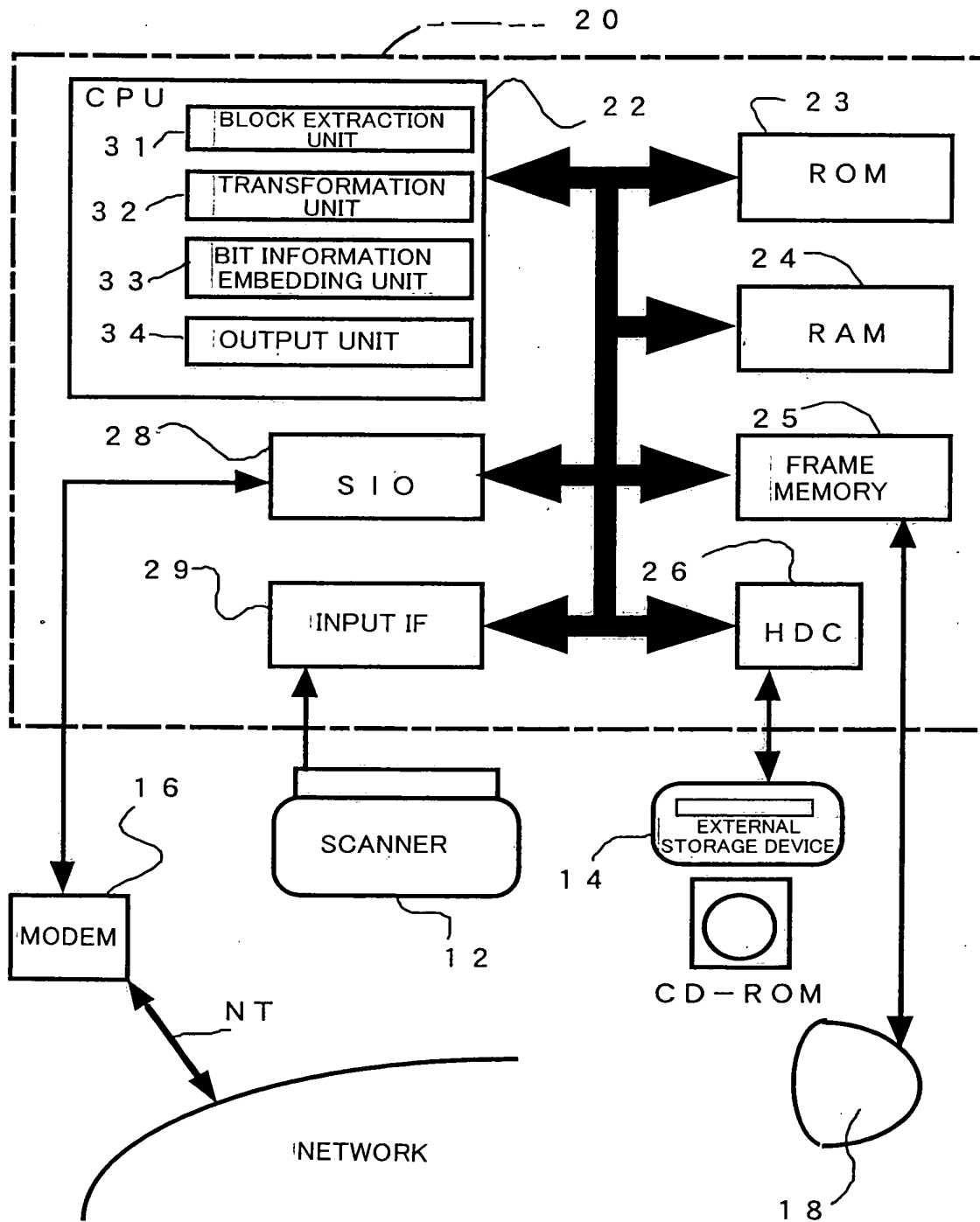


Fig. 3

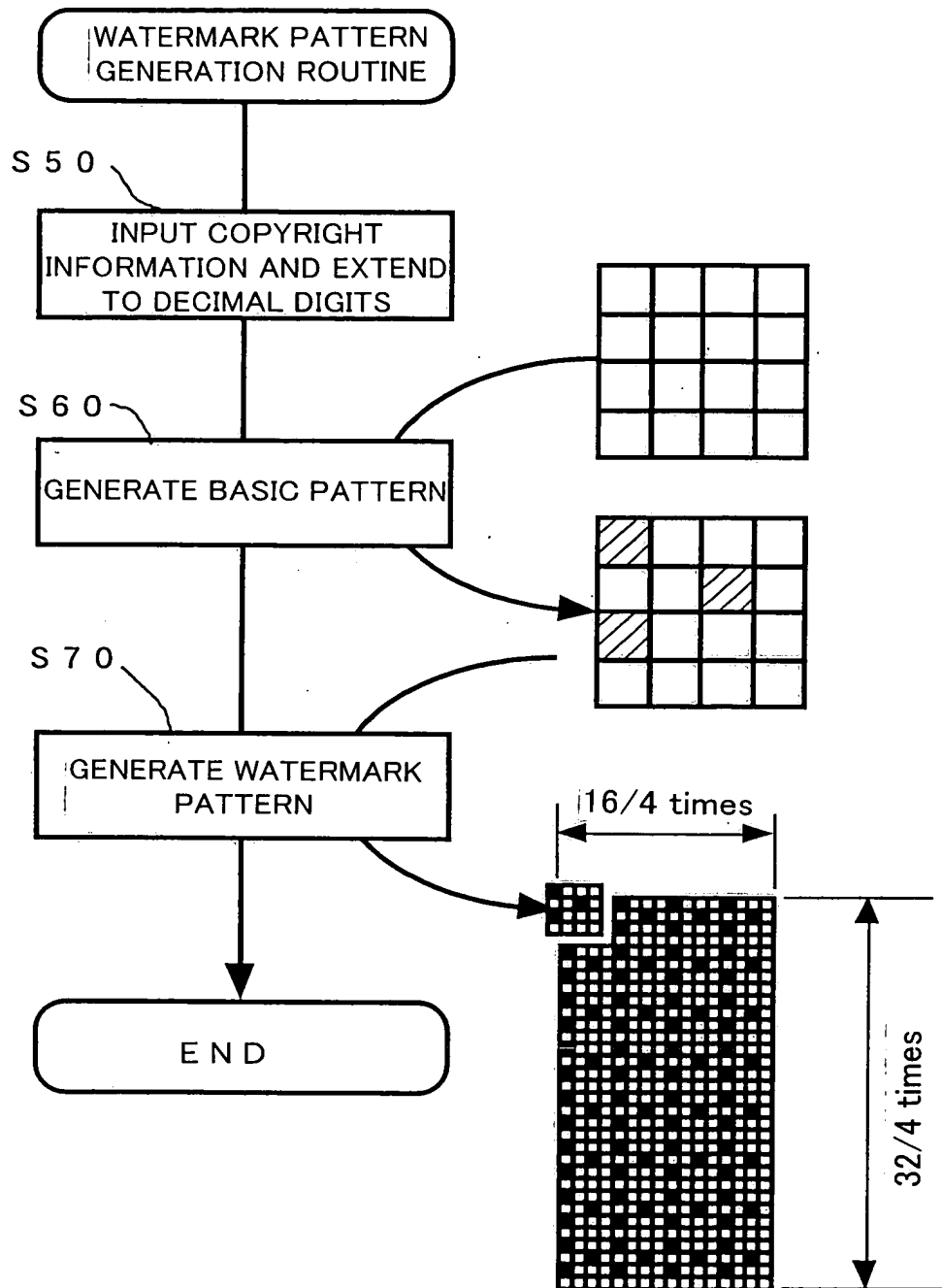


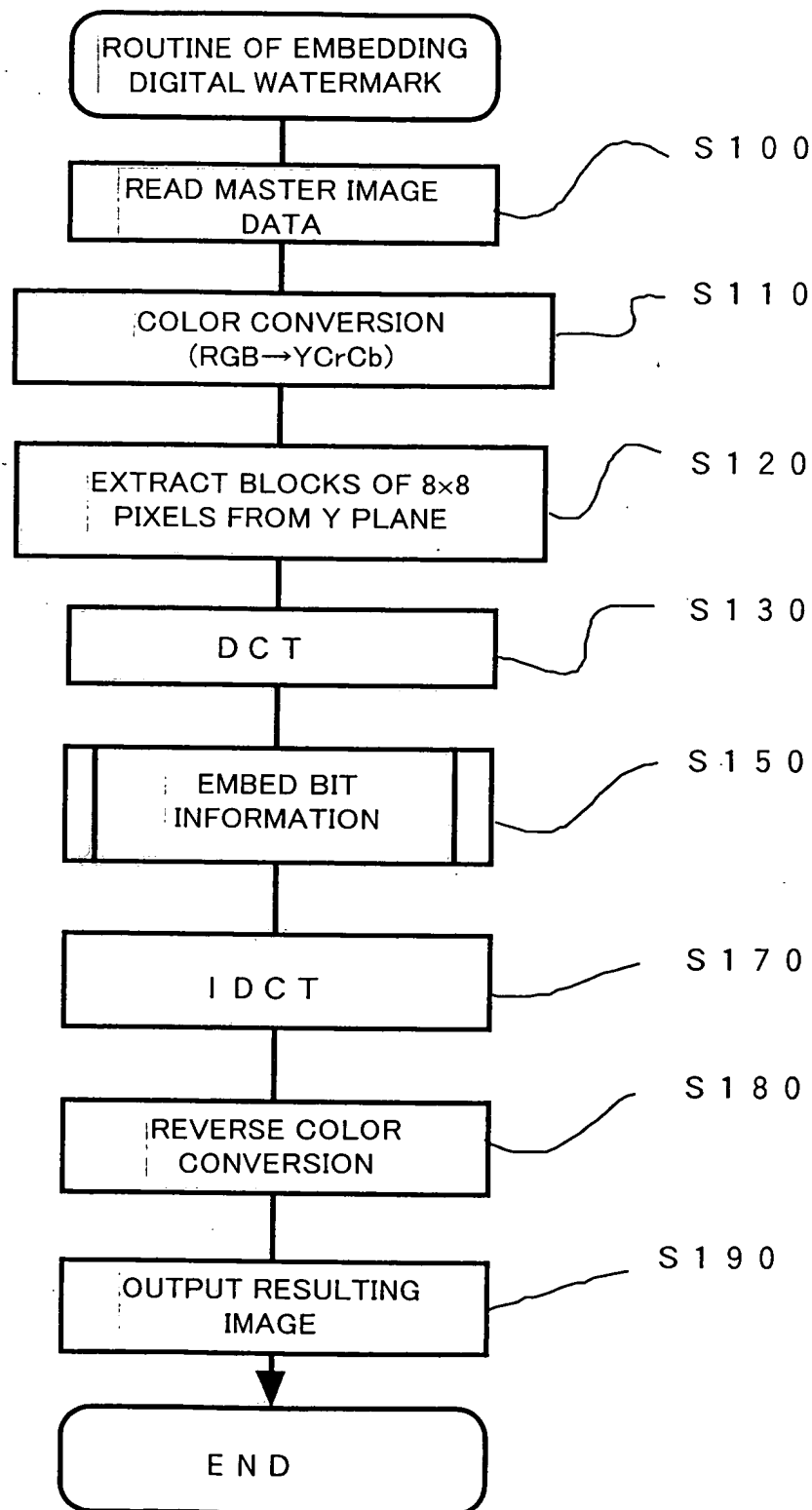
Fig.4

s (0)	s (1)	s (2)	s (3)
s (4)	s (5)	s (6)	s (7)
s (8)	s (9)	s (10)	s (11)
s (12)	s (13)	s (14)	s (15)

Fig.5

m	$16 \pi m$	b m
1	1 6	4
2	1 2 0	6
3	5 6 0	9
4	1 8 2 0	1 0
5	4 3 6 8	1 2
6	8 0 0 8	1 2
7	1 1 4 4 0	1 3
8	1 2 8 7 0	1 3
9	1 1 4 4 0	1 3
1 0	8 0 0 8	1 2
1 1	4 3 6 8	1 2
1 2	1 8 2 0	1 0
1 3	5 6 0	9
1 4	1 2 0	6
1 5	1 6	4
1 6	1	0

Fig. 6



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graph TD
    Start([ROUTINE OF EMBEDDING  
BIT INFORMATION]) --> S151[INPUT DCT COEFFICIENTS  $D_i(u,v)$ ,  $D_{i+1}(u,v)$  OF  
ADJOINING BLOCKS IN Y PLANE]
    S151 --> S152[IDENTIFY QUANTIZED COEFFICIENTS  $f_u(i,j)$ ,  $f_{u+1}(i,j)$ ]
    S152 --> S153[" $d(i,j) = | f_u(i,j) - f_{u+1}(i,j) |$ "]
    S153 --> S154[SPECIFY KEY INFORMATION K]
    S154 --> S155[EXTRACT BIT INFORMATION  $s(u)$  TO BE  
EMBEDDED FROM WATERMARK INFORMATION S]
    S155 --> S156[| CALCULATE LOGIC VARIABLE D]
    S156 --> S161[| CALCULATE OUTPUT LOGIC FUNCTION E1]
    S161 --> S162{E 1 = 1 ?}
    S162 -- YES --> S163[| ADD  $e(i,j)$  TO GREATER ONE OF  $f_u(i,j)$  AND  $f_{u+1}(i,j)$ ]
    S162 -- NO --> S165
    S163 --> S165[| CALCULATE OUTPUT LOGIC FUNCTION E2]
    S165 --> S166{E 2 = 1 ?}
    S166 -- YES --> S167[| SUBTRACT  $e(i,j)$  FROM GREATER ONE  
OF  $f_u(i,j)$  AND  $f_{u+1}(i,j)$ ]
    S166 -- NO --> S169
    S167 --> S169
    S169{PROCESSING  
HAS BEEN CONCLUDED FOR ALL  
COEFFICIENTS?}
    S169 -- YES --> End([END])
    S169 -- NO --> S151

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Fig. 8

DIGITAL WATERMARK DIFFERENCE		S				OUTPUT LOGIC FUNCTION
		0		1		
D	0	1	0	1	0	E1
	1	0	1	0	1	E2
KEY		0	1		0	
		K				

Fig. 11

KEY DIFFERENCE		K	
		0	1
D	0	1	0
	1	0	1

Fig. 9

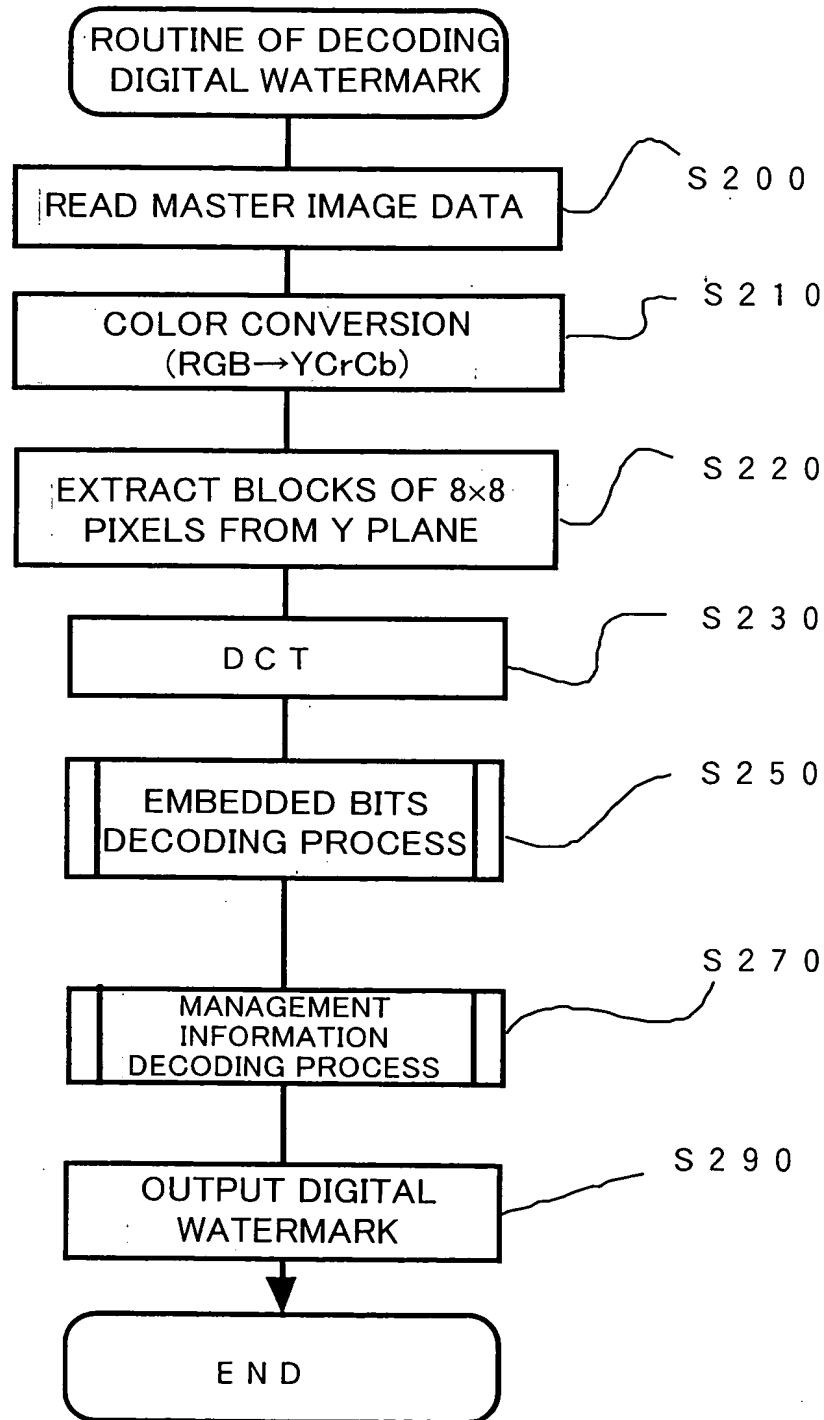




Fig. 10

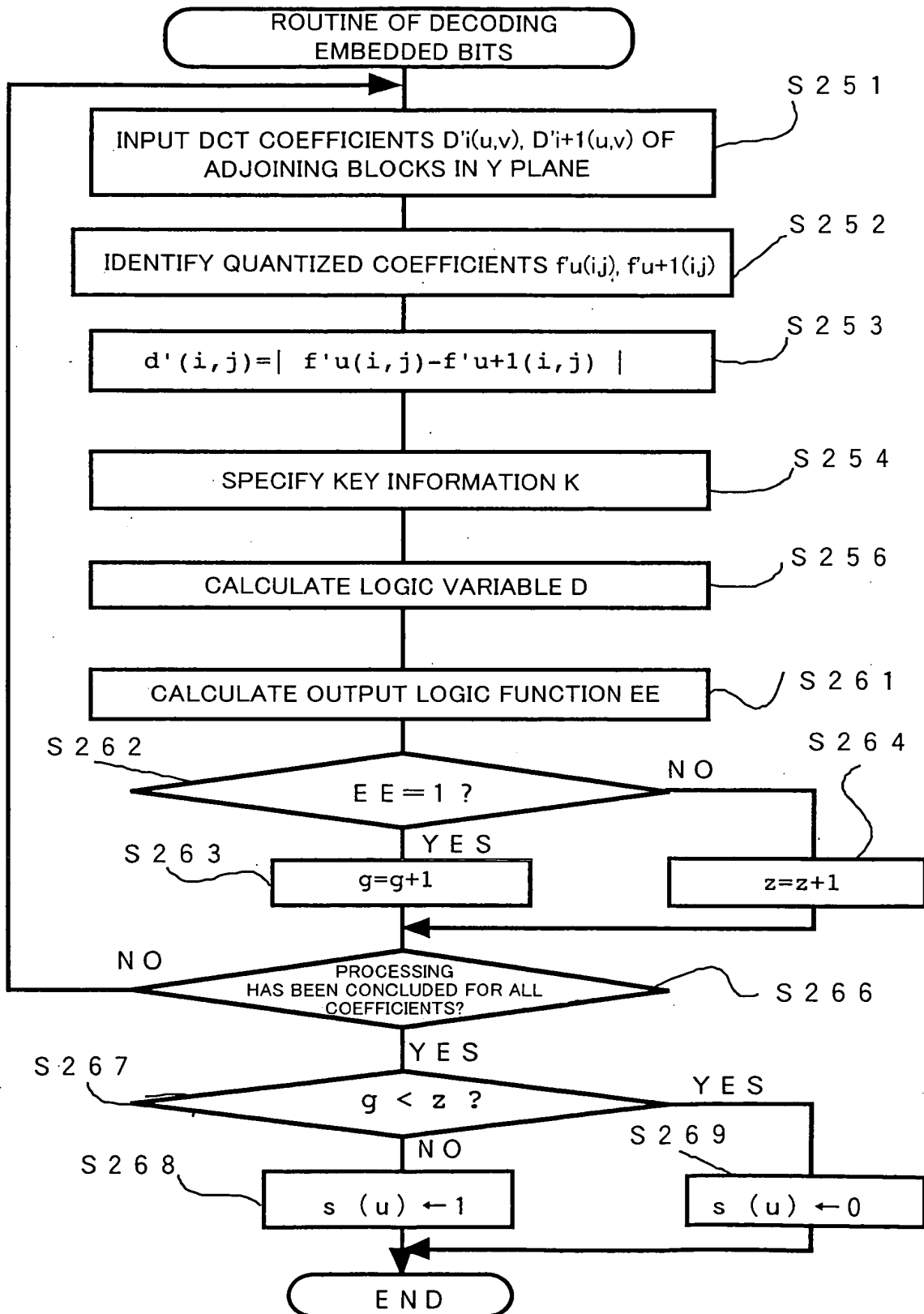
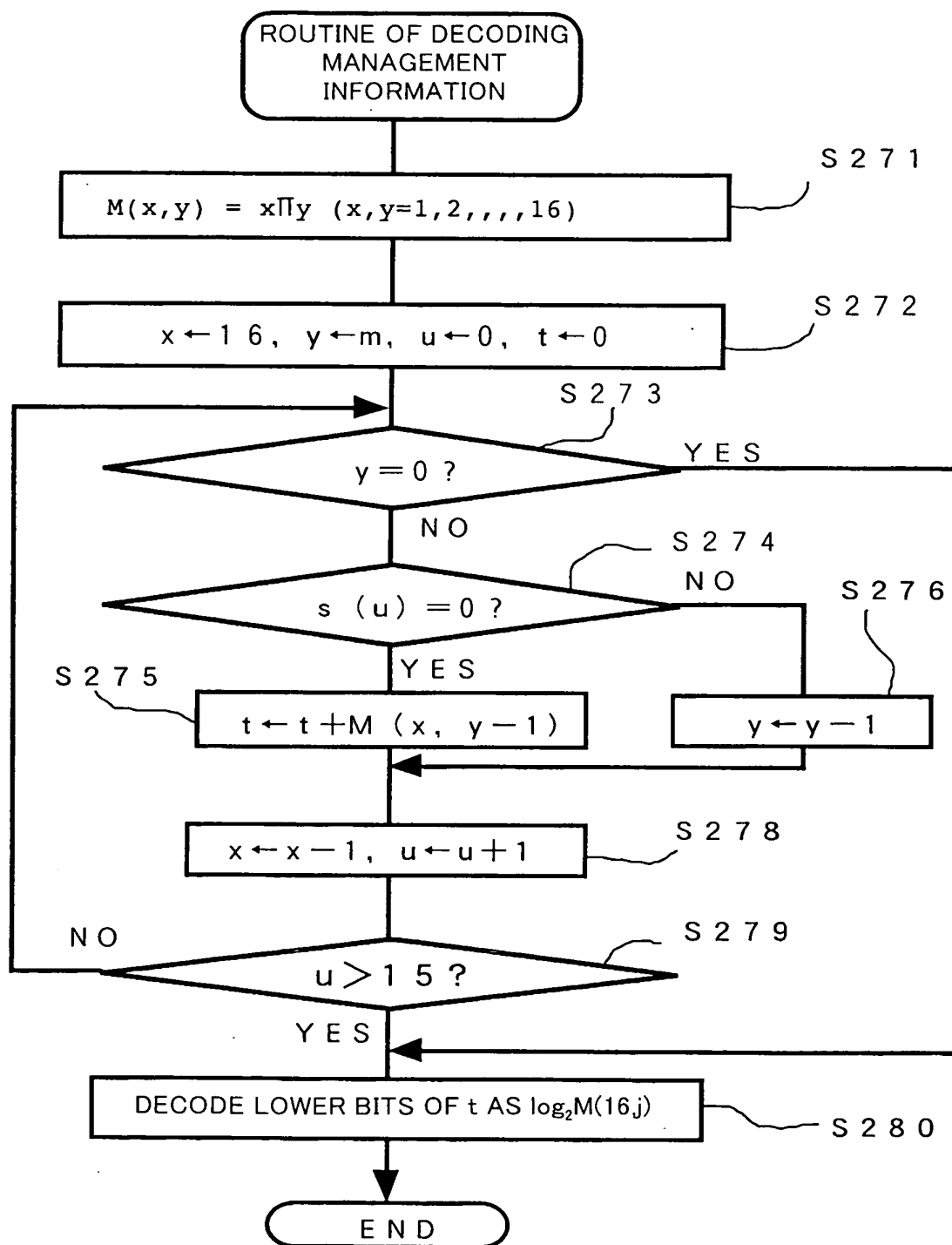


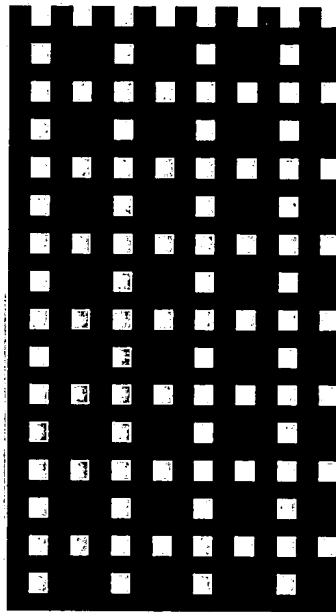
Fig. 12



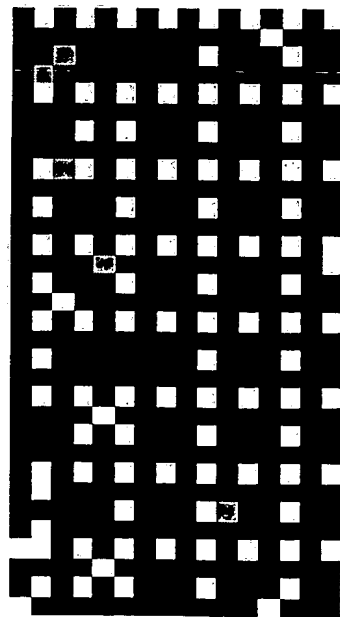
*Fig. 13*



*Fig. 14*



*Fig. 17*



*Fig. 15*



*Fig. 16*

